

## **CHANGES IN THE MONTHLY STATE LABOR FORCE ESTIMATES METHODOLOGY**

The U.S. Bureau of Labor Statistics (BLS) is changing the way monthly estimates of unemployment and total employment are calculated. The changes will take place with the January 2005 estimates of unemployment and total employment. A Federal Register Notice with the proposed methodological changes will be published November 8, 2004 (<http://www.gpoaccess.gov/fr/>).

In recent years, the benchmark revisions to the monthly estimates have increased yearly. Based on the benchmark revisions, the current methodology underestimates unemployment and overestimates total employment. This has resulted in significant end-of-year revisions in a number of states and caused discontinuities between December-benchmarked and January-modeled estimates. The current state models introduce spurious cyclical fluctuations, and do not adequately reflect the effects of major national shocks to the economy in the state estimates.

### **THREE MAJOR REVISION PROPOSALS FOLLOW THREE YEARS OF RESEARCH**

- First, a third generation of state models was developed. The proposed state models are Signal+Noise statistical models for employment and unemployment. The revised state models improve the quality of the state estimates by directly estimating the trend (growth) and seasonal components of monthly changes in unemployment and total employment.
- Second, group processing with census regions serving as divisions will replace state-by-state processing of estimates. Processing the states by divisions increases the reliability of the monthly Current Population Survey (CPS) estimates. The greater reliability of the CPS estimates made possible real time benchmarking of the state monthly estimates.
- Third, for each division of states, state estimates will be benchmarked against the monthly divisional CPS estimates. That is, states' monthly estimates of unemployment and total employment will be the benchmarked estimates. The monthly 'real time' benchmarking will eliminate large end-of-the-year revisions.

The proposed changes will have a significant impact on the monthly estimates, especially, real time benchmarking. A benchmark is a reliable total to which much less reliable estimates are controlled. For the LAUS (Local Area Unemployment Statistics) redesign models, the reliable control total (benchmark) is the monthly CPS national estimate of employment and unemployment. Real time benchmarking means that the adjustment to the reliable control total (benchmarking) occurs as part of monthly estimation (in real time). The current method uses a state benchmark that is the CPS annual average of employment and unemployment. The current benchmarking method is historical in that the correction is performed retrospectively—at the end of the year—after twelve months of estimates are produced.

The monthly national CPS labor force estimates provide an excellent benchmark because of its low variance. The confidence interval on the monthly national unemployment rate is plus or minus two-tenths of a percentage point, and the sample design is such that a difference of two-tenths of a per-

centage point in the unemployment rate over the month is statistically significant.

The redesign methodology requires the monthly state employment and unemployment model estimates to add to the national levels. This will preclude differences between the sum of state estimates and the national estimates, ensure that national shocks related to the business cycle or to an event such as the terrorist attacks of September 11 will be addressed, and will significantly reduce annual revisions.

The redesign model is a Signal+Noise model, where the signal is a bivariate model of the unemployment or employment levels. The unemployment insurance claims and nonfarm payroll employment inputs themselves are modeled, as well as their interaction with the appropriate CPS series. Seasonal, trend, and irregular components are developed for each modeled estimate. Seasonal adjustment occurs within the model structure through the removal of the seasonal component. The models produce reliability measures for the seasonally adjusted and not adjusted series, and on over-the-month and over-the-year change. Each month, real time benchmarking occurs in a two-step process. Census division models are constructed that are controlled to the national CPS. State models are then controlled to their appropriate division estimates.

The nine Census divisions geographically cover the nation. For LAUS estimation, the states are grouped into these census divisions for which models are developed that provide reliable intermediate benchmark controls. Grouping states also simplifies the computational and operational aspects of real time benchmarking. If all states were controlled directly to the national total, a delay in one state would impact everyone. The relative shares of each state's model estimates to its division total are preserved by the monthly benchmark adjustment, but the absolute size of the adjustment to a state's monthly model estimate will be directly related to the size of the model estimate. Thus, large states get larger adjustments than small states. As a result, smaller states in a division will not be dominated by one large state. Idaho is in the Mountain Census Region with Arizona, Colorado, Montana, Nevada, New Mexico, Utah, and Wyoming. While the census division groupings have performed well, research will continue on alternative aggregations for state control purposes.

### **ADVANTAGES OF NEW APPROACH**

- The production of reliable measures on the seasonally adjusted and not seasonally adjusted series and on over-the-month and over-the-year change, which will enhance analysis of the series.
- Direct seasonal adjustment of employment and unemployment.
- Greater understanding of the contributions of the non-CPS model inputs (unemployment insurance claims and nonfarm payroll employment) through bivariate modeling.
- Additivity to national and division estimates of employment and unemployment each month, thus ensuring the timely reflection of economic events in the state estimates.
- Reduction in the expected size of the annual revisions to the state employment and unemployment series through the use of real-time benchmarking to the national estimates.

### **DISADVANTAGES OF NEW APPROACH**

- The use of census divisions as an intermediate estimation level requires interdependence of estimation among states in each division. States will

no longer be able to produce final labor force estimates on their own.

- Interdependence of estimation makes the approach vulnerable in the event of missing state data. To preclude that, a provision has been made to temporarily substitute model predictions for missing state data in the production of labor force estimates.
- The official annual averages of employment and unemployment for states from the LAUS program will no longer be identical to the sample-based annual average estimates from the CPS published in *Geographic Profile of Employment and Unemployment*.

The new models are more accurate and reliable than the current models. The current model cannot produce measures of error for the seasonally adjusted estimates, which makes it difficult to judge its reliability. The redesign model will produce measures of error for both seasonally adjusted and not seasonally adjusted series, and for over-the-month and over-the-year change. Significant improvements in accuracy and reliability of the redesign estimates reflect the provision of more comprehensive error measures and the use of real time benchmarking to monthly levels of national employment and unemployment. Monthly national CPS data are more reliable than the state annual average estimates. At the end of the year, the current method puts much of the sampling error back into the estimates through benchmarking to state CPS annual averages. The redesign method reduces both sampling error and bias in the estimates.

All substate areas in the state will be controlled to add to the monthly state estimates of employment and unemployment, as is the case with the current methodology. So improvements in state estimation will be reflected in these substate estimates.

During 2004, estimates using the current methodology and the proposed methodology are being compared to determine if the proposed methodology worked as expected. In Idaho during the first six months of 2004, seasonally adjusted monthly estimates of the unemployment rate produced by the proposed methodology were approximately 0.45 of a percentage point higher than the monthly estimates produced by the current methodology. The higher unemployment rates under the proposed methodology were expected because of the incorporation of real time benchmarking into the monthly estimates.

The current estimates are not wrong; they are based on the modeling and benchmarking approach that reflected state-of-the-art methodology and operations in 1994. To the extent possible, improvements were made in the years leading up to the proposed approach. Moreover, until the completion of the dual estimation period, the redesign estimates should be considered developmental.

The entire historical series from January 1976 forward will be replaced with estimates based on the redesign models. The revised historical data will also be available on the BLS website ([www.bls.gov](http://www.bls.gov)).